

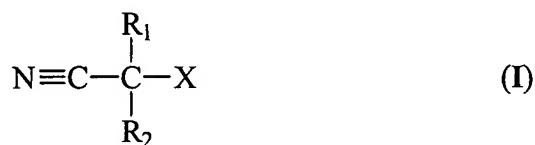
Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in this Application:

Listing of Claims:

1. (Canceled).
2. (Canceled).
3. (Canceled).
4. (Canceled).
5. (Canceled).
6. (Canceled).
7. (Canceled).

8. (Currently amended) The ~~A~~ non-aqueous electrolyte of claim 1 which comprises (1) at least one electrolyte salt selected from the group consisting of LiPF_6 , LiBF_4 , LiAsF_6 , LiCl_4 , $\text{LiN}(\text{SO}_2\text{CF}_3)_2$, and a lithium perfluoro-sulfonate and the combination thereof, (2) at least a first non-aqueous solvent of cyclic carbonate and (3) at least a second non-aqueous solvent being at least one of the nitrile compounds represented by the following general formula (I):



wherein R_1 , R_2 are selected, independent of one another, from the group consisting of hydrogen, C_{1-3} alkyl, fluorinated C_{1-3} alkyl groups; wherein X is selected from a) ether radical having a chemical structure of $-\text{O}-\text{R}_3$, b) ester radical having a chemical structure of

$-\text{O}-\overset{\text{O}}{\parallel}{\text{C}}-\text{R}_4$, c) carbonate radical having a chemical structure of $-\text{O}-\overset{\text{O}}{\parallel}{\text{C}}-\text{O}-\text{R}_5$, and d) alkyl radical having a chemical structure of $-(\text{CH}_2)_y-\text{OR}_8$, wherein R_3 , R_4 , R_5 are selected, independent of one another, from the group consisting of C_{1-3} alkyl and fluorinated C_{1-3} alkyl,

y stands for an integer of 1, and R_8 is selected from the group consisting of C_{1-2} alkyl, wherein the first solvent is present in an amount of 5 % by weight or more, wherein the second solvent is

present in an amount of from about 20 to about 95% by weight as of the total of non-aqueous solvents, wherein the ionic conductivity of said electrolyte is greater than 9×10^{-3} S/cm at about 25°C.

9. (Currently amended) The non-aqueous electrolyte of claim +8, wherein the ionic conductivity of said electrolyte is greater than 1×10^{-3} S/cm at about -30°C.

10. (Currently amended) The non-aqueous electrolyte of claim +8, wherein the ionic conductivity of said electrolyte is greater than 3×10^{-4} S/cm at about -50°C.

11. (Currently amended) The non-aqueous electrolyte of claim +8, wherein the weight loss of said electrolyte is less than 3% after heated at 90°C for 2 hours.

12. (Currently amended) The non-aqueous electrolyte of claim +8, wherein the weight loss of said electrolyte is less than 5% after heated at 90°C for 4 hours.

13. (Currently amended) The non-aqueous electrolyte of claim +8, wherein the freezing point of said electrolyte is less than -60°C.

14. (Currently amended) The non-aqueous electrolyte of claim +8, wherein the boiling point of said nitrile is higher than 120°C.

15. (Currently amended) The non-aqueous electrolyte of claim +8, wherein the flash point of said nitrile is higher than 60°C.

16. (Currently amended) The non-aqueous electrolyte of claim +8, wherein the molecular weight of said nitrile is smaller than 90.

17. (Canceled).

18. (Canceled).

19. (Canceled).

20. (Canceled).

21. (Canceled).

22. (Currently amended) A method of making a lithium-ion battery ~~of claim +17~~ which comprises (1) at least one positive electrode made of lithiated metal oxide selected from the group consisting of LiCoO_2 , LiNiO_2 , LiMn_2O_4 , LiFePO_4 , and $\text{LiCo}_x\text{Ni}_{1-x}\text{O}_2$ wherein the x is from 0.1 to 0.9, (2) at least one negative electrode made of carbonaceous material selected from the group consisting of coke and graphite, (3) a separator membrane, and (4) a non-aqueous

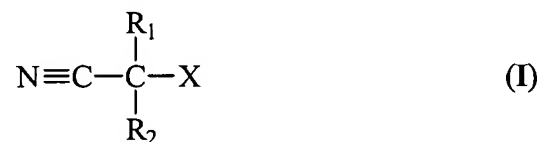
electrolyte which comprises (i) an electrolyte salt, (ii) a first non-aqueous solvent, and (iii) a second non-aqueous solvent being at least one of the nitrile compounds represented by the following general formula (I) :



wherein R₁, R₂ are selected, independent of one another, from the group consisting of hydrogen, C₁₋₃ alkyl, fluorinated C₁₋₃ alkyl groups; wherein X is selected from a) ether radical having a chemical structure of -O-R₃, b) ester radical having a chemical structure of

$\text{—O—}\overset{\text{O}}{\parallel}\text{C—R}_4$, c) carbonate radical having a chemical structure of $\text{—O—}\overset{\text{O}}{\parallel}\text{C—O—R}_5$, and d) alkyl radical having a chemical structure of $\text{—(CH}_2\text{)}_y\text{—OR}_8$, wherein R₃, R₄, R₅ are selected, independent of one another, from the group consisting of C₁₋₃ alkyl and fluorinated C₁₋₃ alkyl, wherein y stands for an integer of 1, and R₈ is selected from the group consisting of C₁₋₂ alkyl, wherein the second solvent is present in an amount of from about 20 to about 95% by weight as of the total of non-aqueous solvents, the method comprising the steps of:

- (a) assembling battery by sandwiching at least a separator membrane between at least a positive electrode and at least a negative electrode,
- (b) packaging the assembled battery cell into a battery case,
- (c) preparing non-aqueous electrolyte of claim 1 which comprises (1) at least one electrolyte salt selected from the group consisting of LiPF₆, LiBF₄, LiAsF₆, LiCl₄, LiN(SO₂CF₃)₂, and a lithium perfluoro-sulfonate and combinations thereof, (2) a first non-aqueous solvent of cyclic carbonate, a second non-aqueous solvent being at least one of the nitrile compounds represented by the following general formula (I):



wherein R_1 , R_2 are, selected, independent of one another, from the group consisting of hydrogen, C_{1-3} alkyl, fluorinated C_{1-3} alkyl groups; wherein X is selected from a) ether radical having a chemical structure of $-O-R_3$, b) ester radical having a chemical structure of

$\text{—O—}\overset{\text{O}}{\parallel}\text{C—R}_4$, c) carbonate radical having a chemical structure of $\text{—O—}\overset{\text{O}}{\parallel}\text{C—O—R}_5$, and d) alkyl radical having a chemical structure of $-(CH_2)_y-OR_8$, wherein R_3 , R_4 , R_5 are selected, independent of one another, from the group consisting of C_{1-3} alkyl and fluorinated C_{1-3} alkyl, wherein y stands for an integer of 1, and R_8 is C_{1-2} alkyl, wherein the second solvent is present in an amount of from about 20 to about 95% by weight as of the total of non-aqueous solvents, and

(d) adding the non-aqueous electrolyte into the battery case.

23. (New) The method of claim 22, wherein said electrolyte salt is a mixture of $LiPF_6$ and $LiBF_4$ in a molar ratio from about 90:10 to about 50:50.

24. (New) The method of claim 22, wherein the first solvent is present in an amount of from about 5 to about 80 by weight as of the total of non-aqueous solvents.

25. (New) The method of claim 22, wherein the second non-aqueous solvent is selected from the group consisting of 3-methoxypropionitrile, 3-ethoxypropionitrile, methoxyacetonitrile, ethoxyacetonitrile, 2-acetoxyisobutyronitrile, 2-cyanoisopropyl methyl carbonate, 2-acetoxyacetonitrile, 2-acetoxyisopropionitrile, cyanomethyl methyl carbonate, and 1-cyanoethyl methyl carbonate.

26. (New) The method of claim 22, wherein the second non-aqueous solvent is present in an amount of from about 25 to about 80% by weight as of the total of non-aqueous solvents.

27. (New) The method of claim 22, wherein the second non-aqueous solvent is present in an amount of from about 30 to about 50% by weight as of the total of non-aqueous solvents.

28. (New) The method of claim 22, wherein said electrolyte salt comprises a cation and an anion, said cation being selected from the group consisting of lithium ion, sodium ion and potassium ion, and said anion being selected from the group consisting of anions of halides of

elements of the groups IIIa and Va of the periodic table, halogen anions, and perchloric acid anions.

29. (New) The non-aqueous electrolyte of claim 8, wherein said electrolyte salt is a mixture of LiPF_6 and LiBF_4 in a molar ratio from about 90:10 to about 50:50.

30. (New) The non-aqueous electrolyte of claim 8, wherein the first solvent is present in an amount of from about 5 to about 80 by weight as of the total of non-aqueous solvents.

31. (New) The non-aqueous electrolyte of claim 8, wherein the second non-aqueous solvent is selected from the group consisting of 3-methoxypropionitrile, 3-ethoxypropionitrile, methoxyacetonitrile, ethoxyacetonitrile, 2-acetoxyisobutyronitrile, 2-cyanoisopropyl methyl carbonate, 2-acetoxyacetonitrile, 2-acetoxyisopropionitrile, cyanomethyl methyl carbonate, and 1-cyanoethyl methyl carbonate.

32. (New) The non-aqueous electrolyte of claim 8, wherein the second non-aqueous solvent is present in an amount of from about 25 to about 80% by weight as of the total of non-aqueous solvents.

33. (New) The non-aqueous electrolyte of claim 8, wherein the second non-aqueous solvent is present in an amount of from about 30 to about 50% by weight as of the total of non-aqueous solvents.